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CONTENTS

Logical Positivism: ALBERT E. BLUMBERG and HERBERT FEIGL 281

How a Logic of "Propositions" Fails of Complete Generality: HENRY BRADFORD SMITH 296

Book Reviews:

Broad's Five Types of Ethical Theory: WALTER G. EVERETT..... 298

Strong's Essays on the Natural Origin of the Mind: ROSS THALHEIMER 301

Maritain's An Introduction to Philosophy: STERLING P. LAMPRECHT.. 304

Journals and New Books..... 307

Notes and News..... 308

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their fundamental ideas? (Translation of an Abstract of the *Zeitschrift für Physik*, 63, 706, 1930. Neuchâtel: James Guinchard. 1930.)

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NOTES AND NEWS

We regret to announce the death on April 25 at Chicago of Professor George Herbert Mead of the University of Chicago.

The second International Congress of the History of Science and Technology will be held at the Science Museum, South Kensington, London, June 29 to July 3, 1931.

The Congress originated with the Comité International d'Histoire des Sciences which was founded at Oslo on August 17, 1928. This body meets annually in Paris and organizes every three years a Congress in which persons interested in the History of Science and Technology are invited to take part. For the coming Congress the Comité has enlisted the coöperation of its parent body, the Comité International des Sciences Historiques, together with that of two other international societies, the History of Science Society, Washington, D. C., and the Newcomen Society for the Study of the History of Engineering and Technology, London.

The present Congress will comprise morning sessions for papers and discussions, afternoon visits to places of historical and scientific interest, and evening receptions. It is intended that the papers and discussions will centre around the following three themes: (1) The sciences as an integral part of general historical study; (2) historical and contemporary inter-relationship of the physical and biological sciences; (3) inter-dependence of pure and applied science.

Applications for membership should be sent to the Honorable Secretary at the headquarters of the Congress at the Science Museum, South Kensington, S.W. 7, London.

VOL. XXVIII, No. 11. MAY 21, 1931

THE JOURNAL OF PHILOSOPHY

LOGICAL POSITIVISM

A NEW MOVEMENT IN EUROPEAN PHILOSOPHY

ONE of the most interesting phenomena in recent European philosophy has been the convergence of two significant traditions: the positivistic-empirical and the logical. Comparable in importance with the Kantian synthesis of rationalism and empiricism, this new movement is sharply distinguished from it both by its results and by the fact that it embodies not the work of an individual, but the agreement of numerous logicians, philosophers, and scientists independently arrived at. This is particularly encouraging in a field like philosophy in which anything approaching a general unanimity has seemed hopelessly unattainable.

The essence of this new development is its radically novel interpretation of the nature, scope, and purpose of philosophy—an interpretation gradually achieved through extensive inquiries into the foundations of logic, mathematics, and physics. Its foremost philosophical exponents are R. Carnap (Vienna), H. Reichenbach (Berlin), M. Schlick (Vienna), and L. Wittgenstein (Cambridge, England).[1] It is interesting to note that recent American publications by P. W. Bridgman, Suzanne K. Langer, and C. I. Lewis exhibit related tendencies.[2]

To facilitate criticism and forestall even more unfortunate attempts at labelling this aspect of contemporary European philosophy, we shall employ the term "logical positivism." Although it is per-

[1] The more important works of the authors named are listed here. The new journal *Erkenntnis* (Annalen der Philosophie), Vol. 1, 1930, pp. 311–339, contains a complete bibliography of the movement. R. Carnap: *Der logische Aufbau der Welt*, Benary, Berlin, 1928. *Scheinprobleme in der Philosophie*, Benary, Berlin, 1928. H. Reichenbach: *Philosophie der Raum-Zeit Lehre*, De Gruyter, Berlin, 1928. "Ziele und Wege der physikalischen Erkenntnis," in *Handbuch der Physik*, ed. by Geiger and Scheel, Vol. IV, pp. 1–80, Springer, Berlin, 1929. M. Schlick: *Allgemeine Erkenntnislehre*, 2te Aufl., Springer, Berlin, 1925. "Erleben, Erkennen, Metaphysik," *Kant-studien*, Vol. XXXI, pp. 146–158, 1926. "Die Wende der Philosophie," *Erkenntnis*, Vol. I, pp. 4–11, 1930. *Fragen der Ethik* Springer, Wien, 1930. L. Wittgenstein: *Tractatus Logico-Philosophicus*, Kegan Paul, London, 1922.

[2] P. W. Bridgman: *The Logic of Modern Physics*, Macmillan, New York, 1927. S. K. Langer: *The Practice of Philosophy*, Holt, New York, 1930. C. I. Lewis: *Mind and the World-Order*, Scribner's, New York, 1929.

haps the best among many poor ones, the name may suggest a mere rephrasing of traditional positivism. However, this is not the case. Indeed, it is precisely the union of empiricism with a sound theory of logic which differentiates logical positivism from the older positivism, empiricism, and pragmatism. The vigorous empirical tradition of Hume, Mill, Comte, and Mach founded its philosophizing upon the principle that all knowledge is based upon experience. But reacting against the poverty of traditional formal logic, these philosophers fell into the error of carrying their empiricism too far. Some, like Mill, sought to treat mathematics and logic as inductively established empirical sciences; others, like certain pragmatists, neglected pure logic entirely by confusing it with psychology and scientific method.

The new logical positivism retains the fundamental principle of empiricism but, profiting by the brilliant work of Poincaré and Einstein in the foundations of physics and Frege and Russell in the foundations of mathematics, feels it has attained in most essentials a unified theory of knowledge in which neither logical nor empirical factors are neglected. From the point of view of logical positivism, the Kantian synthesis concedes too much to rationalism by assuming the existence of synthetic *a priori* truths. Against Kant the new movement maintains as a fundamental thesis that there are no synthetic *a priori* propositions. Basing its assertions upon recent developments in factual and formal sciences, it holds that factual (empirical) propositions though synthetic are *a posteriori*, and that logical and mathematical propositions though *a priori* are analytic.

It is fundamentally this new understanding and use of the analytic character of logic which has made possible the convergence of the empirical and logical traditions. By means of the theory of knowledge thus constructed, logical positivism goes beyond the Comtean and pragmatic rejection of metaphysics as useless or superfluous and shows that the propositions of metaphysics, in most senses of the term, are, strictly speaking, meaningless.

The exposition of logical positivism given here will be necessarily short and dogmatic. Some, but by no means all, of what seem to be the most fundamental issues will be touched. The purpose throughout will be to indicate what types of problems are being investigated and the general character of the results obtained.

I

We turn first to a summary of the recent advances in pure logic which have made this new type of philosophizing possible. With the enormous growth in the flexibility of symbolic logic has come a new insight into the nature of pure logic. The answer to the problem of

the relations between the logical and the empirical is primarily the contribution of Wittgenstein, building upon Frege, Russell, and Whitehead.[3]

Wittgenstein attacks the purely logical problem of knowing, namely, the analysis of language—where by the term "language" is meant any medium of communicating knowledge, any set of symbols and their syntax or rules of combination. Logic in the wide sense is then shown to be the system of conventions which determine the syntactical order required if we are to have a consistent language.

Thus, though language says something about reality, logic by its very nature has nothing to do with experience, since it concerns the internal structure of language. The so-called theorems of logic are simply rules for tautological transformations, i.e., rules for repeating in whole or in part what has been said in another form. The familiar "laws of thought" (principles of identity, contradiction, excluded middle) constitute as a group the stipulation that the concrete interpretation given to symbols should be definite and unambiguous. The term "identity" has no meaning as applied to reality; only symbols can be identical and these only when they have the same concrete meaning.

Whereas in the Russell-Whitehead system a proposition can be accepted as a part of logic only when it follows by definite rules from a limited set of axioms or postulates, on the Wittgenstein view there is no such difference between axioms and theorems in logic. A proposition is a proposition of logic when it is tautological; its tautological character can be recognized by analyzing it in isolation. Thus the Russell-Whitehead axiomatization of logic is a practical convenience, but not essential to logic. For in logic, in contradistinction to geometry, there is no first and last; all propositions of logic are on the same plane.

The view that the propositions of logic are tautologies is based upon the distinction between atomic or simple propositions and molecular or complex propositions and the thesis that the latter are always truth-functions of (i.e., results of truth-operations upon) the atomic constituent propositions. The distinction betwen atomic and molecular propositions may be regarded for the purposes of logic as relative; the further problem of the absolutely atomic propositions belongs to epistemology. By logical or truth operations are meant, for example, negation, disjunction, conjunction, implication—formerly termed logical constants. Thus negation is the conversion of the truth-value of a proposition to false; disjunction means that at least one of the two disjuncts is true, etc. A tautology

[3] Wittgenstein: *op. cit.*, 6.1ff, 4.3ff. Carnap: "Die alte und die neue Logik," *Erkenntnis*, I, pp. 12–26, 1930.

is then essentially a repetition of the conventions set up as truth-operations. For example, "p or not-p" is tautologically true because of the very definitions of "or" and "not." Thus, in general, any proposition is a tautology when it is true whatever may be the truth-value of the component propositions.

It follows further that it is nonsense to doubt the validity of deduction since deduction is always tautological transformation and therefore asserts nothing new. This does not mean that logic is necessarily trivial, but that it can be made so, that is, it can be reduced to a series of tautological steps each of which, considered individually, is trivial. Professor Hahn, the Vienna mathematician, has summed this up strikingly in the remark: "Ein allwissendes Subjekt braucht keine Logik und im Gegensatze zu Plato können wir sagen: niemals treibt Gott Mathematik."

Much has been written about the problem of implication. To get at the nature of deduction we must distinguish material implication (which holds between any two propositions in all cases except when the first is true and the second false) and analytic or tautological implication (which holds between propositions whatever their truth-values). Deducibility is present only when it can be shown that the implication in question is tautological. Deducibility is therefore not definable in terms of truth-operations since it involves analytic implication and the latter depends on the inner constitution of the propositions in question. An example of analytic or tautological implication is the relation between the set of postulates (p) and the set of deduced theorems (q) in a geometry; "p implies q" is here tautological.

The question arises often whether there are many possible logics just as there are innumerable possible geometries. Certainly, there are many forms of expounding logic, but these (presumably even the many-valued logic) are merely different symbolic expressions of the same thing. Logic is what is common to all systems of language or symbolisms. In its widest sense it is the stipulation that we adhere to definitions and conventions initially agreed upon, that we be consistent and unambiguous.

In logic there is no "problem of application" as in geometry. In empirical science the problem is solved through a system of "applicational" definitions (*Zuordnungsdefinitionen*) which lay down the empirical meaning of the symbols employed. But, as Wittgenstein has pointed out, the logical constants or truth-operations represent nothing in reality. The proposition "a is x *and* b is y" says no more about reality than the two propositions "a is x" and "b is y"; the word "and" says nothing about the world.

The importance of logic as a tool lies in its ability to develop

new and complicated forms or patterns for the representation of facts. Russell's notion of the propositional function has been particularly important; a class is to be defined by means of a propositional function with a single variable, a relation by means of a propositional function of two or more variables. The investigation and application of the structural properties of relations—symmetry, reflexivity, transitivity—has been of fundamental importance in the epistemology of Carnap and others.

Of particular interest to philosophers is Russell's theory of types, in its simple form. This asserts that a particular concept has meaning only for objects of a particular type (e.g., individuals, classes, classes of classes); for example, a function can not be an argument to itself. This is important in that it gives a necessary, though not sufficient, criterion for the meaningfulness of propositions.

Finally, Russell's view of arithmetic as a branch of logic is beset with several difficulties. There is much work being done on this problem by Wittgenstein, Carnap, and others. At least this much is clear, that, contrary to Kant, the propositions or equations of arithmetic are analytic. The same holds for the purely mathematical theory of probability.

With this insight into the tautological nature of logic we understand the true meaning of the assertion that logic is *a priori* valid. Logic can not be contradicted by empirical facts precisely because it says nothing about them. Logic is *a priori* because it is analytic. Thus, the difficulties which the older empiricism and positivism encountered in attempting to account for logic and mathematics on an empirical basis disappear. Empiricism, the denial of synthetic judgments *a priori*, is now in a position to develop a theory of knowledge capable of doing full justice to logic and mathematics.

II

One of the most important contributions of recent theory of knowledge has been the removal of the ambiguity in the term "knowledge" through the definite formulation of the distinction between knowledge proper (*Erkenntnis*) and immediate experience (*Erlebnis*)—between "knowledge by description" and "knowledge by acquaintance."[4] This distinction occupies a fundamental place in logical positivism. From it the consequence is drawn that knowledge or the communicable expresses the formal structure but not the content of experience. For the immediately given is private, noncommunicable. It can be pointed to by means of demonstratives

[4] B. Russell: *Problems of Philosophy*, Ch. IV. M. Schlick: "Erleben Erkennen, Metaphysik," *op. cit.* L. S. Stebbing: *A Modern Introduction to Logic*, T. Crowell & Co., Ch. III, 1930. Though similar distinctions had been made in the past, Russell was one of the first to see its fundamental importance.

like "this," "that," "here," "now," "I"; but assertions in which such words occur are not propositions in the strict sense. In other words, it is not the experienced qualitative content as such which is mirrored in any system of knowledge, but the formal structure or relations of the given. This becomes clear if we consider that a modification of the world in which a consistent substitution of qualities (e.g., red for green and green for red) took place would leave the whole edifice of knowledge unchanged. For, though it may seem at first glance that "red," "hot," "bitter," etc., signify the immediately given qualities themselves, we see that knowledge, as distinguished from mere "listing" or "cataloguing," does not begin until we recognize relations of similarity or dissimilarity between experiences. Hence, from the point of view of knowledge (*Erkenntnis* as distinguished from *Erlebnis*) the essence of "red," etc., is not its experienced quâle, but its unique set of relations to other qualities.

The most radical and elaborate development of the thesis that knowledge consists of propositions concerning the formal characters of experience is to be found in Carnap's *Der logische Aufbau der Welt*. Here the attempt is made to show in outline that all concepts of empirical science can be constituted or constructed by purely logical operations upon a single primitive relation and the primitive elements between which it holds. This relation and its terms are logically primitive; in this system they are indefinable and can only be pointed to. Carnap has chosen as the indefinable relation "remembrance of similarity" (*Aehnlichkeitserinnerung*); the terms between which the relation subsists are total momentary experiences, cross-sections of consciousness. This means in short that any proposition of empirical science can be completely translated into a complicated series of propositions which refer only to the relational structure of the given as expressed in the fundamental relation and terms. On this level, we are expressing the structure and pointing to the content of the given. Even should further analysis indicate that Carnap's particular attempt to construct all empirical concepts from a single primitive relation is unsuccessful, this would not alter the essential point; that the propositions of empirical science express the formal structure and not the content of experience.

Additional light is shed on the matter if we approach it from our definition of knowledge as the communicable. What knowledge communicates is structure; this it does by means of a symbolism or language. Against this limiting of knowledge to the symbolically communicable it might be objected that knowledge independent of symbolization is present in thinking as contrasted with writing and speaking. This overlooks the point that purely conceptual mirrorings of facts employ images, etc. as symbols instead of sounds or

shapes. The term "language" is to be used in a wide sense to refer to all systems of symbols regardless of their nature as facts.

A language consists of a set of symbols which are to be combined in accordance with a definite logical syntax. The purpose of language is to mirror or express facts. This is done by means of a syntax so selected that the relations of words in the proposition represent the relations of elements in the fact. The proposition expresses the fact, therefore, in virtue of a structural similarity between it and the fact. This similarity itself can not be expressed in the same language. To express it we should require a different language in which a proposition would express this similarity in virtue of a similarity between it and the similarity. Russell, in his introduction to Wittgenstein's *Tractatus Logico-Philosophicus,* indicates that the difficulty might be met by an unending hierarchy of languages. Wittgenstein takes the position that the similarity is inexpressible. It shows itself.

This isomorphy of the system of language and the system of facts would hold, however, only when all molecular propositions had been analyzed into their constituent atomic propositions. It is not clear in Wittgenstein what propositions are atomic; the set of propositions expressing the order of shapes and colors in a visual field may serve as examples. Carnap's work is the only attempt so far to analyze to this limit the complex propositions of empirical science. There all complex propositions are reduced to sets of atomic propositions which are unanalyzable in that they contain only the fundamental relation and terms.

The theory of atomic propositions leads us to the central problem of epistemology, the problem of meaning. The importance of a sound theory of meaning is familiar in view of the contributions and discussions of pragmatism.

Meaning is to be distinguished at the outset from emotional or effective significance, which is irrelevant for epistemology, though essential for art. Further, we must distinguish in the use of the term "meaning" as applied to propositions and to words or concepts. To know the meaning of a proposition is to know what must be the case if the proposition is true. The meaning of a complex proposition is revealed when we analyze it into its component atomic propositions. The meaning or sense (*Sinn*) of an atomic proposition is the "being-the-case" or the "not-being-the-case" of the fact which it expresses. The meaning (*Bedeutung*) of a complex word or concept is given by explicit definition; that of a simple word or name by pointing to what it stands for in experience. We differentiate here between the names of a single unique object (e.g., a point in a momentary visual field) and names of recurrent objects (e.g., red, remembered similarity).

It is a commonplace that deductive systems can be built up in different ways, that is, that primitive terms and relations may be chosen more or less arbitrarily. This is true if it is simply a task of axiomatizing a given subject-matter. But there is a privileged way in which a general axiomatization of knowledge can be carried out, namely, the way indicated by the procedure of verification. To get at the atomic propositions, the most fruitful way is not to ask in the Cartesian manner what is indubitable—but to inquire under what conditions a given proposition is true. If we can not give these conditions, we do not know the meaning of the proposition; if the conditions can not possibly be given, the proposition has no meaning. Thus working back from complex to simple we arrive ultimately at the immediate facts whose being-the-case constitutes the meaning of the proposition. Given a complex proposition, we always ask how it is verified.

As against the coherence theory of truth it is held that the single atomic proposition is true or false. It is true when the fact which it asserts is the case, false when it is not the case. The truth or falsity of propositions is ascertained by comparing them with reality.

Thus through an analysis of knowledge and symbolism we are led to a theory of meaning in terms of facts and propositions. We see again how knowledge, though it communicates only the form of the given, none the less is based upon the content, for the words in the atomic propositions are definable only concretely through pointing to content. Knowledge expresses the form and points to the content.

III

Logical positivism has thus grown up in close contact with investigations into the foundations of the sciences. There, too, it has found its most fruitful applications.

Knowledge, we have seen, expresses in terms of propositions the formal structure of experience. We must distinguish two uses of the term "formal": the first, as contrasted with content, the second, as contrasted with factual.

By formal sciences are meant logic and pure mathematics. These sciences are formal in that they say nothing about facts. Logic and arithmetic are tautological; pure geometry is concerned with relations of analytical implication between sets of propositional functions. All formal sciences are engaged, then, in elaborating symbol-patterns and assert nothing about experience.

The factual or empirical sciences (physical, natural, social) are concerned with applying these patterns to the description of the relational structure of experience. This application of purely formal patterns to facts is effected by means of concrete definitions

which lay down the empirical meaning of our symbols and thus enable us to raise the question whether certain symbol-patterns actually fit the facts that have been gathered by observation and experimentation.

Of the formal sciences, geometry is particularly important in that it shows so well the step from formal to factual science. After centuries of confusion, the distinction between pure and applied geometry has been made precise. Einstein's well-known essay "Geometrie und Erfahrung" expresses this admirably. Applied geometry is a factual science, a branch of physics. It describes the spatio-temporal relations of physical objects. On the other hand, a pure geometry (as in the axiomatization of Euclid by Hilbert, Veblen, etc.) is a system of propositional functions which lay down a definite syntax for theorems concerning a certain number of variables. That is, the terms "point," "line," etc., in Hilbertian geometry mean nothing empirical or observable; they are purely logical symbols or variables possessing those characteristics laid down in the axioms. The philosophical importance of this method of implicit definition (i.e., of defining terms by properties stipulated in axioms) was first seen by Schlick.

In pure geometry it is not the axioms which hold necessarily, but the relation of deducibility between axioms and theorems. A geometry, in other words, is not a categorical deductive system (Euclid, Kant), but hypothetical deductive (Pieri, etc.). Necessity is always analytic; the choice of axioms always arbitrary.

Here, can be indicated the fundamental difference between arithmetic and geometry. In arithmetic, it seems at least plausible at present, that each theorem or equation is itself a tautology. In geometry, it is the implication between postulate-set and deduced theorems which is tautological, though the separate theorems and axioms are not.

The method of implicit definitions thus lays down the purely formal structure of concepts; in order to apply them to the description of the formal characters of experience "applicational" definitions are required which correlate these formal concepts with empirical content. Reichenbach, in particular, has stressed this distinction between the *"Verknüpfungsaxiomen"* which implicity define the concepts and the *"Zuordnungsdefinitionen"* which apply them to experience. In physics, the *"Zuordnungsdefinitionen"* takes the form of what Bridgman terms "operations."

It is only when through these "applicational" definitions we have made the transition from pure geometry to physical geometry that the question of the truth or falsity of a geometry can arise. The question, however, can not be answered simply. In a certain

sense, as Poincaré saw, we can never be compelled to term a given geometry false. This is due to the fact that we have two elements which can be varied: the axioms and the "applicational" definitions. Given a set of postulates, the definitions can be so chosen that the axioms hold for experience. Euclidean geometry, today, can still be retained if we select very complicated "applicational" definitions.[5]

The choice of geometries is then fundamentally a question of simplicity. The choice between Euclidean and Non-Euclidean geometry depends on whether we prefer simpler axioms or simpler "applicational" definitions. It is interesting to note that mathematically oriented writers like Poincaré, Dingler, and Whitehead prefer Euclidean geometry, due to its greater axiomatic simplicity. It has, however, proved more fruitful in physics to take simpler "applicational" definitions since they are more directly applicable. The purpose of physics is to predict; this requires relatively simple "applicational" definitions. Thus in the theory of relativity it follows that if we take the simplest "applicational" definitions, we find that Non-Euclidean rather than Euclidean geometry accurately describes our facts. Thus the question of the truth or falsity of a geometry can not be raised and answered until we specify a set of "applicational" definitions. The term "simplicity" needs further elucidation. Reichenbach distinguishes between descriptive and inductive simplicity. The former has nothing to do with truth or falsity, but is simply a matter of convenience. Thus, the vectorial treatment of electromagnetics is descriptively simpler than the analytic; polar coördinates are often simpler than Cartesian in solving a given problem of empirical science. Inductive simplicity, on the other hand, presupposes descriptive simplicity, but involves more. For example, when we pick the (descriptively) simplest set of axioms which covers the given facts with a minimum of complication in the concrete definitions, it is no longer a question of convenience, but a question of truth and falsity, or rather of probability.

Reichenbach has shown that Euclidean geometry can be retained if, to account for the bending of light-rays, changes in clocks and measuring rods, etc., we introduce *ad hoc* "metrical" forces which, in that they affect all material bodies in the same way, are sharply distinguished from ordinary physical forces. If, however, we stipulate that the "applicational" definitions are to be so selected that all metrical forces are set equal to zero, then the choice between

[5] Reichenbach: *op. cit.*, particularly "Ziele und Wege," pp. 35–36, 47–49. H. Feigl: *Theorie und Erfahrung in der Physik*, Braun, Karlsruhe, 1929. See especially pp. 120–128.

Euclidean and non-Euclidean geometry can be made by direct comparison with facts.

In this application of purely structural systems to reality the question of truth and falsity is further complicated by the fact that all scientific theories are built on general propositions whose validity obviously can never be rigorously established. Induction, as Hume saw, is not a logical procedure. To this Reichenbach assents, but he looks to a widened logic which, through the concept of implication with probability, will legitimize induction without committing the error of attributing certainty to it.

In this and other ways there are important differences between Reichenbach and the Viennese. For the latter, the concept of probability, which Reichenbach takes as a fundamental idea, is definable either (*a*) purely logically, for the mathematical theory of probability or (*b*) as statistical frequency. For them, therefore, applied probability is definable ultimately in terms of the truth or falsity of the propositions describing individual cases of the phenomenon in question (e.g., the tossing of a coin). However, the intricate problem of induction is far from solved and is at present one of the chief subjects investigated.[6]

The principle of causality is for the logical positivist not a categorical necessity of thought, not a necessary assumption of science, but simply a model for building laws of nature. The problem whether causal (deterministic) laws accurately describe what takes place, the problem whether ours is a causal or a statistical universe, rests with empirical science and can never be decided with certainty. The causality concept even in classical physics was closely connected with the concepts of probability and simplicity; in the old formula—under similar circumstances similar effects follow—it is obvious that the requisite data could be determined only with probability. Indeed, the classical principle of causality, precisely formulated, asserts that the probability of the occurrence of a particular event is greater the more exactly certain definite initial conditions are ascertained; whereby it is tacitly assumed that there is no limit, other than practical difficulties of measurement, to the determinability of all the relevant initial conditions. If the recent developments of quantum physics prevail, and this seems likely, their philosophical significance will be primarily that, as a consequence of the Heisenberg indeterminacy relation, the requisite initial conditions can never be completely measurable and our predictions can accordingly never attain complete certainty.

All factual sciences, then, are essentially applications of pure

[6] See papers by Reichenbach, Feigl, Waisman, and Mises in *Erkenntnis*, Vol. I, Numbers 2–4, 1930.

symbol-patterns to the description of facts. But since the laws, e.g., of physics, are universal propositions and induction is not logically justifiable, the propositions of science though synthetic assert probabilities and are therefore not *a priori*. Thus neither in the formal nor in the factual sciences do the Kantian synthetic judgments *a priori* appear.

IV

The previous sections of this paper have served to present logical positivism in its logical and epistemological setting and to show its dependence upon and application to the recent developments in formal and factual sciences. We turn now to the view held by this new movement concerning the nature and aim of philosophy. The position is best summarized by Wittgenstein: "The object of philosophy is the logical clarification of thought. Philosophy is not a theory but an activity. The result of philosophy is not a number of 'philosophical propositions' but to make propositions clear." [7]

This critical function, which is the essence of philosophy, rests upon such an epistemology as that outlined above and has for its ultimate goal the purification of language, the elimination of meaningless assertions. Philosophy in this sense of critical activity addresses itself to both the sciences and to the traditional subject-matter of philosophy. Carnap's *Konstitutionstheorie* is an example of analyzing the meaning of scientific propositions by following them back to the given. It is practically necessary, of course, for the logical analysis of physics to remain as Reichenbach and Bridgman do in the sphere of physical concepts and employ common-sense objects and instruments; but, in view of certain difficulties and in order to achieve a thoroughgoing analysis, we must go back to the ground-floor of knowledge, the given. In Carnap's work, this has been partly carried out, partly suggested in a hitherto unrivalled form.

Carnap indicates that if we arrange empirical concepts in levels corresponding to increasing complicatedness of construction of—and thus remoteness from—the given, we find the most fruitful application of Russell's theory of types. The difference, for example, between physical and psychological concepts is a difference of types. For everything said in physics can, because of the requirement of verifiability in terms of experience, be translated into the psychological language. This, Carnap terms methodological solipsism, for the elementary experiences which are at the basis of the edifice are, if we speak from a higher level, "my" experiences. It is shown in detail how on this basis the objective (i.e., intersubjective) world can

[7] Wittgenstein: *op. cit.*, pp. 4, 11. See, too, Schlick: *Die Wende der Philosophie.*

be constructed through a series of increasingly complicated combinations of the given.

This analysis of concepts has an interesting application to the problem of the existence of other minds. Since the meaning of propositions is identical with the conditions of their verification, therefore, propositions concerning other minds are completely translatable into propositions concerning total (theoretically) observable behavior and these, in the last analysis, are completely translatable into propositions concerning "my" experience. The familiar analogy argument to the existence of other minds is untenable since argument by analogy is permissible only when there exists the possibility of subsequently verifying the conclusion empirically. An "immediate perception" of other minds would not alter the case, for it would then be our own mind, not that of another, of which we were aware. These results may seem fantastic to many, but those who read Carnap's analysis will see how the "plus" added to behavior can in no way be formulated, but must be interpreted in terms of associated emotional significance.

In addition to the positive task of clarifying the propositions of the sciences, philosophy has the largely negative task of analyzing the subject-matter traditionally ascribed to it, particularly metaphysics. Logical positivism goes beyond the earlier positivistic and pragmatic rejection of metaphysics as superfluous which applied the principle of Occam's razor. For the new positivism, metaphysical propositions are, strictly speaking, meaningless, since a proposition has meaning only when we know under what conditions it is true or false.

Applying the criterion of meaning first to ethics it is clear that ethics as "normative" science is impossible. Experience revels what is, never what ought to be. Ethical imperatives are always hypothetical, never categorical. Ethics is not a science like sociology, but a technology like medicine; it is an application of the results of descriptive science to the pursuit of happiness.[8]

As for metaphysics in its various forms, it follows that the great historical systems of metaphysics, in general, can not be characterized as meaningful. They have, of course, tremendous affective efficacy, and often possess genuine esthetic merit. But since their propositions are admittedly incapable of empirical verification, they have no meaning as knowledge. The silent mystic is the sole consistent metaphysician.

A special type of metaphysics, the inductive, is usually meaningful as science, e.g., the atomic theory of Democritus. As a rule such metaphysics involves hasty extrapolations. But as long as the ex-

[8] See M. Schlick: *Fragen der Ethik*, Springer, Wien, 1930.

trapolations remain within the realm of the (theoretically) empirically verifiable, they are not meaningless. The basis for rejecting inductive metaphysics is purely practical or methodological; it is usually though not always bad science.

It might be objected that the theory of meaning employed here is too narrow—that it arbitrarily excludes other than empirical verifiability. To this it may be replied first that the theory of meaning in question suffices for all scientific purposes whether we consider the physical or the natural or the social; Carnap's book demonstrates precisely this. But, secondly, we may counter by asking what other type of verification can be advanced. There have in general been two quite different methods suggested; the intuitive and the "dialectical." Intuitive metaphysics holds that knowledge can be acquired through pure intuition without ordinary logical and empirical factors. But the belief in this royal way, as Schlick has pointed out, rests in the end upon a confusion between knowledge and immediate non-cognitive experience. Intuitive metaphysics is the vain search to know (i.e., describe) content, to express the inexpressible.[9]

By dialectical demonstrations are meant those which, admittedly incapable of empirical verification, are based upon cogency of argument, analysis of the implications of ideas and the like. An example of this is the realist's inference from sense-data to the transcendental causal objects. The belief in the validity of such argumentation is based upon a failure to see the tautological or analytical nature of all necessary inference or formal implication. Since deducibility is tautological, the conclusion can not contain logically any more than is asserted in the premises of the argument, in this case empirical sequences. Nor is dialectical demonstration in the sense of a merely probable inference to entities beyond experience permissible. Probable inference is but another name for argument by analogy or by induction. Such argumentation is valid only in empirical questions, where the possibility of subsequent empirical verification of the conclusion is present.

It is this illegitimate use of the notion of inference which lies at the bottom of most metaphysics—particularly some forms of realism. Russell, in a passage quoted by Carnap at the beginning of his major work (but forgotten by Russell if one may judge by his *Analysis of Matter*) states: "The supreme maxim in scientific philosophizing is this: Wherever possible, logical constructions are to be substituted for inferred entities." Logical positivism goes farther and asserts that in every case where so-called inferred entities are invoked, the term "inference" is meaningless; what is really meant as a rule is that such entities are constructs of the given.

[9] Schlick: "Erleben, Erkennen, Metaphysik," *op. cit.*

The development of mathematics in the nineteenth century provides us with an instructive analogy. Early mathematics went on to new types of numbers (rational, real, complex) by the method of postulation. That is, they stipulated the mathematical existence of numbers having the desired properties. The critical investigation of the foundations of mathematics from Weierstrass, Cauchy, and Cantor, Dedekind to Whitehead and Russell has shown that all types of numbers can be constructed purely logically from the series of natural numbers. Analogously, logical positivism feels that it has shown that all so-called inferred entities—be they tables, atoms, or other minds—are to be constructed purely logically from experience. Therefore, as in mathematics the most abstract theorem of analysis can be completely translated—and this is its justification—into a series of propositions concerning natural numbers, so logical positivism holds that the propositions of the empirical sciences can be completely translated—and this, again, is their justification—into a series of propositions containing only terms designating the given.

In that it rejects all transcendentalism, logical positivism is often termed phenomenalistic. This is correct if the term is employed methodologically, incorrect if by phenomenalism is meant the metaphysical assertion that only phenomena, i.e., immediate experiences, exist. This proposition is meaningless because unverifiable; there is no way of giving the conditions under which we should call it true or false. Like the assertions of realism and idealism, in short, it contains the metaphysical concept of reality or existence to which no meaning can be assigned. In the conduct of science, this concept has no place; the concept of empirical reality is independent of these metaphysical differences. It is in this sense that science forever remains metaphysically neutral. The realistic and idealistic geographers who debate the reality or existence of a mountain in Africa, always decide the question empirically by facts regardless of their metaphysical differences. Empirical reality (as distinguished, for example, from illusoriness) means orderability in the space-time physical universe; this is always determinable through a specific means of empirical verification. To say that something is real is to say that certain data are observed, that certain facts are the case. It means nothing more.[10]

There are, to be sure, varieties of meaninglessness. The simplest are cases of confusion in logical type; thus, in Russell's theory of number "seven is red" is meaningless, since we have sustituted as a value in the propositional function "x is red," not an "individual" as required, but a something of a different type, namely, a class of classes. Usually the meaninglessness of assertions can be traced to

[10] See R. Carnap: *Scheinprobleme in der Philosophie, op. cit.*

the occurrence in them of undefined (but not primitive or logically undefinable) concepts, for example, the metaphysical concept of reality and transcendental concepts in general. The term "will" in Schopenhauer, though meaningful in certain provinces, loses meaning when extrapolated throughout the universe. The meaningfulness of a proposition shows itself when we ask whether it is verifiable.

It may be objected that certain assertions occur in the sciences which are not verifiable. This objection is based on a confusion as to the meaning of the *possibility* of verification. That is to say, the impossibility of verification may be (*a*) purely practical, based on the limitations of our instruments (e.g., propositions concerning the other side of the moon); again, (*b*) the impossibility may be due to the fact that what is asserted is contrary to the laws of nature accepted at the time (e.g., propositions concerning a perpetuum mobile). Such impossibilities do not prove the propositions meaningless. It is only when theoretically as well as practically there is no possibility of verification (e.g., in the case of propositions which contain undefined terms, contradictions, mixture of logical types) that the proposition is meaningless. Concrete instances of the meaningless assertion are those concerning a Ding-an-sich, Unknowables, realism vs. idealism, the "mental states" of others.

The purpose of philosophy is the clarification of the meaning of propositions and the elimination of just such meaningless pseudo-propositions.

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HOW A LOGIC OF "PROPOSITIONS" FAILS OF COMPLETE GENERALITY

THERE are two ways in which a logic of "propositions" fails of complete generality. In the first place its variables are restricted to single truth-values so that it can give no interpretation of multiple-valued expressions. In the second place it recognizes only one meaning of true and one meaning of false. A restricted logic of this sort leads at once to certain so-called paradoxes of the reason.

Suppose that $\phi(p)$ is a multiple-valued expression in p, and suppose $\phi(p)$ becomes either true or false when p takes on in succession the values $a, b, c, \ldots$ so that $\phi(a), \phi(b), \phi(c)$, etc., are all propositions either true or false. If we represent "ϕ is false" by $f\phi$, then $f\phi(a), f\phi(b), f\phi(c)$, etc., are each in turn propositions either

true or false. We may then establish a one-to-one correspondence between the members of the two sets for the case in which the number of true values is the same as the number of false values, supposing that the number of truth-values is finite. The extension of our remarks to functions having an infinite number of truth-values, involving the question as to whether the series is well-ordered and countable, is obvious. Thus if $\phi(p)$ becomes *zero* for $p = a$ and $p = c$ and *one* for $p = b$ and $p = d$ we may establish the following one-to-one correspondence,

$$\begin{array}{cccc} \phi(a) & \phi(b) & \phi(c) & \phi(d) \\ f\phi(b) & f\phi(a) & f\phi(d) & f\phi(c) \end{array}$$

and if a, b, c and d are the only values of p that make $\phi(p)$ either *zero* or *one*, we may say ϕ may be equivalent to $f\phi$ for *all* values of p taken *collectively*, but not for *all* values of p taken *distributively*. It is this fact that would lead to difficulties, if we were to extend our reasoning to the case in which the series, $a, b, c, \ldots$ is infinite, for in that case the question of the legitimacy of the concept of an infinite totality would arise.

Let us now apply this reasoning to an actual case, the problem of Epimenides, which we shall take in the form of

This proposition is false.

Here we seem to have, if p stands for *this proposition*,

$$p = f(p).$$

The solution lies in defining p (a definition the author has given elsewhere) so that it will be two-valued, one value being *zero*, p_0, and one value being *one*, p_1. Then our one-to-one correspondence becomes

$$\begin{array}{cc} p_0 & p_1 \\ f(p_1) & f(p_0) \end{array}$$

and p is the same as $f(p)$ *for all values of* p taken collectively. We remark that two-valued functions are not unfamiliar to the mathematician, the simplest case that one can think of, being perhaps $\sqrt{2}$. The case we have just discussed is a simple logical analogue of this one. Just as p remains two-valued when operated upon by f, so $\sqrt{2}$ remains two-valued when operated upon by minus one.

The second way in which a logic of "propositions" fails of generality lies in failing to distinguish different meanings of the true and the false. The writer has shown elsewhere that these distinctions are infinite in number, that they are all essential (since if any two were identified all would disappear) and that each one can be uniquely defined by an equation whose form can be found at

once by inspection. It is a dictum of the Russellian logic that no variable entering into a function can have the function as one of its possible values. This dictum we deny by making it our definition of false. Thus if $f(p)$ has the form $\phi(p)$, any f which satisfies

$$f(f) = \phi(f)$$

is the meaning of false required. It can be shown that this meaning is unique and it evidently depends on the form of ϕ, which is what we should expect. This solution of the Epimenides problem is independent of the meaning of false, in the sense that it holds for all meanings of false.

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BOOK REVIEWS

Five Types of Ethical Theory. C. D. BROAD. New York: Harcourt, Brace and Company. 1930. xxv + 288 pp.

This volume consists of five essays, together with an Introduction and Conclusion. The essays give an account of the theories of Spinoza, Butler, Hume, Kant, and Sidgwick. The Introduction presents brief biographical data concerning the five thinkers selected for treatment, and the Conclusion offers a "Sketch of the Main Problems of Ethics."

Mr. Broad's method is that of detailed and exhaustive analysis. This method determines at once the merits and the limitations of the work. It is not a book to be read continuously, nor is it one to be offered to the student who has not attained a considerable degree of mastery of ethical theory. Even the hardened initiate will prefer to take it in small doses, consulting the various sections as they chance to become pertinent to any problem in hand. He will then find himself in a position to appreciate the often acute criticisms with which the book abounds.

The statement just given concerning the profitable uses of the work might be illustrated and enforced at length. In the essay on Sidgwick alone, for example, the topics treated, including the divisions and subdivisions which Mr. Broad makes in his discussion, run well up towards a hundred. This characteristic also renders a detailed review impossible unless the reviewer were to write essays corresponding to those of the author.

Readers will perhaps find the treatment of Spinoza somewhat disappointing because of what it deliberately excludes. All that depends on *Scientia Intuitiva,* or the *Third Kind of Knowledge,* viz: the *Intellectual Love of God, Human Blessedness,* and the *Eternity of the Human Mind* is omitted. Mr. Broad insists that, although

these are "among the hardest, the most interesting and the most characteristic parts of Spinoza's system, they belong to his philosophy of religion rather than to his ethics." And to any one who might feel that scant justice is done to the moral wisdom embodied in Spinoza's treatment of the emotions, I think Mr. Broad's reply would be that in his essay he is not concerned with edification, but with the truth or error of an ethical theory. However, he pauses to pay generous tribute to the wisdom and goodness of the man, declaring that in the conduct of his life he "accomplished one of the hardest of all tasks, viz., to be a prophet without being a prig, and to be a saint without being a sponger."

One is not surprised to find the essay on Butler the most readable of the series. The reason is largely expressed in Mr. Broad's own words: "He writes about facts with which we are all acquainted in language which we can all understand; and his work, though it does not pretend to be a complete treatise on ethics, forms one of the best introductions to the subject that exists."

Mr. Broad rightly insists that one outstanding merit of Butler was to give the *coup de grâce* to the widely current theory that disinterested action is psychologically impossible. "He killed the theory so thoroughly," says Mr. Broad, "that he sometimes seems to the modern world to be flogging dead horses. Still all good fallacies go to America when they die, and rise again as the latest discoveries of the local professors. So it will always be useful to have Butler's refutation at hand." Whether America is the heaven of "all good fallacies" and "local professors" their guardian angels, and whether English dons are the final judges of fallacies, both the quick and the dead, are questions of eschatology into which I can not enter. But I will go so far as to support Mr. Broad's view of the vitality of this particular fallacy, at least among students when they first encounter the problem. It always rests upon an ambiguity, or rather a misuse, of language. Because all acts are acts of an ego or a self, they are therefore all egoistic or selfish. So runs the popular statement of the fallacy that Butler so well refuted.

In interpreting Butler, Mr. Broad seems at one important point to leave the good bishop in a dilemma either of doubt or of renunciation of a stoutly affirmed belief. This concerns the place of happiness in his system. Noting the familiar assertion in Sermon XII, Mr. Broad remarks: "In one place he says that it is manifest that nothing can be of consequence to mankind or to any creature but happiness." He then speaks of the *Dissertation on Virtue* as if it offered some qualification of this doctrine. On the contrary, I think it clear that Butler's statements that happiness is the ultimate end or value of existence are made with the essential teaching of the

Dissertation fully in mind. In Sermon XI, he says: "Let it be allowed, though virtue or moral rectitude does indeed consist in affection to and pursuit of what is right and good, as such; yet that when we sit down in a cool hour, we can neither justify to ourselves this or any other pursuit, till we are convinced that it will be for our happiness, or at least not contrary to it." And the footnote to Sermon XII explicitly states the principle of the *Dissertation.* It appears, therefore, as no after-thought or modification of Butler's system. What he gives us is a familiar form of theological Utilitarianism, according to which God has dealt better with mortals than to leave them to a blundering calculation of the hedonic effects of their conduct, "since so many and distant things must come into the account." The appeal to conscience as automatic guide to the final attainment of happiness falls in with the general trend of eighteenth-century thought, which had little confidence in the power of intelligence to plan or control the fortunes of human life. Adam Smith developed this tendency to the full in the economic sphere. The "invisible hand" so arranged terrestrial affairs as to secure the maximum social welfare when there was a minimum interference with the free pursuit of individual advantage.

The shorter essays on Hume and Kant, and the longer, more elaborate paper on Sidgwick may be consulted on occasion both for a careful statement of their theories and for interesting criticisms.

In the *Conclusion* Mr. Broad gives an exhaustive analysis of what he considers the possible forms of ethical theory. His first distinction is between "naturalistic" and "non-naturalistic" types. I confess to a dislike of the term "naturalistic" when there is no suggestion of the fundamental opposition to super-naturalistic which it implies. Elsewhere Mr. Broad shows a wise caution in the use of "natural" which might well have been extended to its derivative. I must, however, resist the temptation to enter upon a criticism of the elaborate scheme of distinctions which he here presents. Most students will be led speedily to invoke the scholastic maxim against multiplication *praeter necessitatem.*

The perusal of Mr. Broad's work will also arouse in many minds serious reflection about the business of ethics. In a frank and genial Preface he warns the reader that he finds it difficult to excite himself "very much over right and wrong in practice," and that he does not consider "a white-heat of moral enthusiasm" to be "the most favorable condition" in which to conduct intellectual inquiries. At the conclusion of his study, in similar vein, he insists that the interest of ethics is "almost wholly theoretical," but "good fun for those who like that sort of thing."

Now as regards the temper in which all intellectual inquiries

should be conducted, and also as regards the "good fun" to be enjoyed in their pursuit, I am wholly of Mr. Broad's mind. But I am at the same time fully convinced that the kind of theorizing in which he engages does not exhaust the legitimate field of ethics. What, one is impelled to ask, of the objective content to which the elaborate inner mechanism is to be applied? What of the social conditions under which the good life wins its fulfillment or goes down to defeat? What of the interests that can permanently inspire and support such a life? Mr. Broad's view of ethics appears as inadequate as would a philosophy of education which should limit itself to a study of the mental powers and processes involved in the acquisition of knowledge, but should disregard or fail to evaluate the subjects to be known. Neither in education nor in morals are the objective interests pursued indifferent; in neither case are they all of equal value; some, far more than others, have the power to quicken and to transform life.

I suspect that the reason for the admitted decline of ethics as an academic discipline is to be found chiefly in a narrow conception of its nature and function. And its scant appeal to popular thought is undoubtedly due to the same cause. One has only to examine prevailing conceptions of morality to discover how little they have been touched by sound reflection. Morality has to do, it is commonly believed, with personal probity in the relations of individuals. The more weighty concerns of daily life have been largely left to the vigorous impulsion and control of non-moral interests. Industry, finance, politics, diplomacy, nature, Providence,—these represent, in various ways, forces which have been thought of as operating according to their own inherent principles, and which will not brook interference. As a result, conscience has easily escaped responsibility even where events were obviously within human control. Not until the hitherto unmoralized activities of men are annexed by ethics, can this greatest of the humanistic disciplines win its rightful place in theory or in practice.

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Essays on the Natural Origin of the Mind. C. A. STRONG. London: Macmillan and Company, Ltd. 1930. Pp. vii + 304.

C. A. Strong's volume, *Essays on the Natural Origin of the Mind*, consists of a brief preface, an introduction, and eight essays, the first four of which essays have, in a slightly different form, appeared as articles in *Mind*.[1] As the preface is philosophically unimportant

[1] Essay I is in Vol. XXXV, pp. 39–58; Essay II, in Vol. XXXV, pp. 137–153; Essay III, in Vol. XXXVII, pp. 173–191; Essay IV, in Vol. XXXVII, pp. 393–413.

and as the reader of the review is probably familiar with the prototypes of the first four essays, I shall confine my expository remarks to the introduction and the last four essays.

In the introduction, Strong states his problem and indicates briefly the manner in which he proposes to solve it. His problem appears to be to "explain" "the connection of mind and body" (p. 1) and "how it" (mind) "comes into being" (p. 2). The solution which he suggests is first, a reinterpretation of matter (p. 3) and second, and what he considers more important, a reinterpretation of mind (p. 4). Modern physics has taken a step in the first direction; and if psychology employs the "physical method," it will take a most important step in the second direction (p. 4). The greater part of the rest of the introduction is devoted to an enumeration of "the chief results to which a thorough employment of the physical method leads" (p. 7).

In the first part (pp. 163–173) of essay V, the author examines Bergson's attack upon Psychophysical Parallelism in "Le paralogisme psycho-physiologique," an attack which Strong thinks is ineffective only against that particular form of the theory which he accepts, viz., a metaphysically monistic form (p. 170) in which "the substance of things" is conceived as "composed of parts" (p. 168). After an intermediate section on "truth and falsity in acquaintance" (pp. 173–185), Strong returns to the problems of the first part of the essay and argues that the "identity theory" alone explains the mind-body relation (pp. 185–191).

Having in preceding essays applied his "theory of awareness" to sense-perception and introspection, the author attempts, in essay VI, to apply this theory to the other cognitive functions. As regards the central problem of the volume, this essay is of particular interest as an attempt to avoid "emergence" by interpreting these cognitive functions in terms of a minimum number of "new" entities.

In the first part (pp. 133–147) of the following essay, the author argues that the act of awareness and the datum of awareness, but not the Self, are simple and indivisible, a view which he proceeds to compare (pp. 247–255) with the closely similar views of Hume, Kant, J. S. Mill, and Clifford. The constituent elements of the Self, which "may be infinite" in number (p. 256), are units of "sentience," a term the meaning of which Strong endeavors (pp. 256–268) to make clear.

In the final essay, the writer defends himself against James' objections to the Mind-Stuff theory in *The Principles of Psychology*, objections which he finds unconvincing principally because of James' failure to distinguish, on the one hand, between the Self,

the acts of awareness, and "the things that appear to them" (pp. 275–294), and on the other hand, between acts of awareness and feelings (pp. 295–304).

There is so much in Strong's argument with which I fear I can not agree that, with the limited space at my disposal, I had better restrict myself to the one or two criticisms of greatest importance. I shall have to pass over, e.g., his odd "theory of error"—a theory according to which it is asserted, among other things, that because there is always an existent in some place at some time, the "apparent thing" and the "real thing" are even "in untruthful perception" "identical as to existence" (pp. 111–112)—and, again, his extremely curious view that "the ultimate elements of sentience are the units existing in points at instants" (p. 256)—a view which, even if it can be rendered intelligible, must remain irreconcilable with his doctrine that bits of sentience have extension and duration.

For one thing, Strong makes no attempt to justify his fundamental assumption (see, e.g., pp. 2–4) that in order to "explain" the relation between mind and matter, mind and matter must be alike. And this, despite the fact that not only has this assumption seemed to a multitude of philosophers lacking in obviousness but, at least when the term "explain" is understood in the "scientific" sense,[2] definitely false.

Nor can it be said that, in the rigorous sense in which Strong construes the term, he *has* "explained" the relation between mind and matter. Take his "explanation" of the origin of mind. Does he not suppose that in the evolution of mind there was an emergence out of bits of sentience at least of sense-data? And does he not admit that sense-data, unlike bits of sentience, are existentially dependent upon the act of perception, are not in Space and Time, have color or tone or odor, etc?

It is true that he very frequently, and quite inconsistently, maintains that sense-data "really are" bits of sentience, as when he insists upon the identity between "what appears as a nervous process" and bits of sentience (see essay VI). But can such an equivalence be maintained? I think not. For a sense-datum if, e.g., it be visual, certainly possesses, to mention only one of its properties, color, whereas bits of sentience presumably possess no color. Strong can not be right, therefore, in saying that the two are "really identical."

This latter objection, an objection which, I believe, faces almost all forms of Panpsychism, suggests another. If what appears as a nervous process is *not* identical with "the inner reality," what "ex-

[2] See Lovejoy's "The Meaning of Emergence and its Modes," *Proceedings of the Sixth International Congress of Philosophy*, p. 9.

planation'' can the Panpsychist give now of their ''parallelism''? Is he not forced back to the very objectionable doctrine of a Pre-established Harmony or to the hardly less objectionable Double Aspect theory? Whatever the correct answer may be, certainly on the surface this destiny appears inevitable. Strong, however, gives no hint as to how he hopes to escape this fate.

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An Introduction to Philosophy. JACQUES MARITAIN. Translated into English by E. I. WATKIN. New York: Longmans, Green and Co. 1930. 272 pp.

M. Maritain's *Introduction to Philosophy* is unique among the texts that seek to introduce students to the problems of philosophy. For he writes as a convinced Aristotelian (with certain Thomistic emphases) and refers to modern philosophy only as a corruption of and unfortunate departure from the truth once for all embodied in Aristotle's *Metaphysics.* As one glances over the introductory texts that have been used during the past generation in American colleges and have poured from the press during the past decade, one can not but recognize the distinctive nature of M. Maritain's enterprise. For teachers who wish to introduce students to philosophy without spending the whole time in resolving the epistemological tangles of modern system-making and to secure a more direct approach to ontological questions, M. Maritain's book deserves attention.

As M. Maritain reads the history of thought, Aristotle ''founded for all time the true philosophy. If he saved whatever was true and valuable, not only in Plato, but in all the ancient thinkers of Greece, and brought to a successful conclusion the great work of synthesis which Plato had attempted, it was because he definitely secured the attainment of reality by the human intellect'' (p. 83). Or again, Aristotle ''found room in his speculations for every variety of being without violating or distorting the facts at any point, displaying an intellectual vigour and freedom to be surpassed only by the crystalline lucidity and angelic force of St. Thomas Aquinas. But this vast wealth is arranged in the light of principles, mastered, classified, measured, and dominated by the intellect. It is the masterpiece of wisdom, a wisdom which is still wholly human, but nevertheless, from its lofty throne, embraces with a single glance the totality of things'' (p. 89). To an Aristotelian metaphysics M. Maritain adds the grace of God and revelation; but he recognizes philosophy as a human and rational enterprise and so does not allow the dogmas of the Catholic Church to control his ontological analyses.

M. Maritain's book falls into two parts. The first part is largely taken up with an historical summary of thought before Aristotle. This part is not very satisfactory. M. Maritain believes in "a primitive tradition . . . that the first man received from God," so that in every race of mankind certain truths are implicitly recognized and are found in a form that is "purer the further back we follow their history" (pp. 24–25). Even about the Greeks before Aristotle he pronounces dogmatically on many points where he is either surely wrong or on very doubtful ground. He assumes (p. 55) that Anaxagora's νοῦς is an anticipation of Aristotle's God. He makes Xenophanes a pantheist without any indication that another interpretation of Xenophanes is possible and even probable. He gives a ridiculous definition of sophistry as "not a system of ideas, but a vicious attitude of mind" (p. 65), being perhaps controlled in his judgment, not by a study of the sophists, but by Aristotle's remark that a sophist is "one who makes money out of apparent wisdom." He catalogues Aristophanes as "a superficial observer" of Socrates's circle, though such scholars as Burnet (in his article on Socrates in the HRE) have established a good case for taking the *Clouds* as a keen and penetrating criticism of the Socratic group. He brushes aside Plato's doctrine of knowledge as recollection without pausing to inquire how best this doctrine might be interpreted. Indeed his whole picture of Plato seems to me decidedly perverse and unjust. He abuses Plato in order to make Aristotle the greater,—or so it seems to my reading of his sketch. Even in mentioning Aristotle's doctrine of the soul he gives it such a twist as to make it a satisfactory basis for the Christian view of the soul as an immortal spiritual substance; and while there are passages in Aristotle that lend themselves to that interpretation, there are more passages of quite a different tenor.

But it seems to me that one could entirely reject the first hundred pages of M. Maritain's book and yet find the remaining one hundred and fifty pages highly useful. At least the second part of his book would play into the hands of a teacher of Aristotelian convictions. M. Maritain states and seeks to prove in turn seventeen conclusions. He is here at his best and exhibits a profound grasp of Aristotle's metaphysical position. These conclusions sum up Aristotle's teaching on such points as the following: the nature of metaphysics as first philosophy, the relation of metaphysics to the special sciences and to theology and to "common sense," the chief divisions of philosophy, the nature of ideas, the origin of ideas, the status of universals, the nature of truth, the intelligibility of being, the accessibility of being to intelligence, the nature of essence as the first principle of intelligibility that our intellects grasp, the nature

of substance, accident, and potentiality. M. Maritain makes more of non-sensible substances that have no ὕλη than does Aristotle; but this fact is due to the Thomistic position in the light of which he reads his Aristotle. On other matters his analysis generally follows Aristotle very closely and with brilliant penetration.

Throughout this second part of his book M. Maritain makes a series of classifications of other philosophies in their contrast with the philosophy of Aristotle. This series is one of the most interesting features of the book. Though the classifications would doubtless require amplification from any teacher who put the book into the hands of elementary students, they are highly instructive and competently executed. In every classification in the series M. Maritain makes the position of Aristotle a happy mean between errors of which other philosophies have been guilty. For example, Aristotle's theory of the relation of metaphysics to the special sciences is the true mean between the Cartesian contention that the principles of the special sciences are directly subordinate to those of philosophy and the positivistic contention that the principles of the special sciences are independent of any metaphysical viewpoint. Or again, Aristotle's respect for "common sense" is the mean between the credulity of the Scottish School and the tendency of "modernist" thought to regard the convictions of common sense as destitute of any speculative value. Or once more, Aristotle's theory of universals is a mean between nominalism and extreme realism. Or still again, Aristotle's theory of substance and accidents is the mean between the contention (as in Descartes) that substance consists wholly in what it essentially is and has no accidents and the phenomenalist contention that substance is nothing but a certain clustering of accidents. Any such series of classifications is perhaps dangerous, as it so easily leads to a distortion of the thought of those used as illustrations of objectionable extremes of error. But, while it can not be a substitute for a careful study of the history of ideas for their own sake, it has pedagogical possibilities.

The usefulness of M. Maritain's book is perhaps twofold. On the one hand it might serve the purposes of teachers who wish to have students work on Aristotle's metaphysics and yet find their students unprepared to dig into Aristotle's text directly. On the other hand it might serve for what its title indicates that it is meant; at least it might serve as a text in a general introductory course when the teacher wishes to take the Aristotelian point of view. Perhaps the book is not quite so useful in the second respect as in the first. For it is a bit cock-sure as well as a bit cut-and-dried. Yet there is something to be said for even a cock-sure book. Introductory courses in philosophy sometimes give students the impression (as

indeed I have heard from more than one college student of serious character) that any opinion is as good as any other because all opinions alike can be established and overthrown with equal ease. It seems to me that many teachers of philosophy, aiming to secure for their students the virtue of a mature spirit of critical detachment, really induce that spirit of misology against which Socrates warns us in the *Phaedo*. I would rather err in being a propagandist for what I believe to be really true than in leaving students with the supposition that it does not really matter what they believe. Of course neither error is necessary, even if both errors are difficult to avoid.

I can not resist saying in conclusion that I regret that M. Maritain's text is so unique among introductions to philosophy. We ought to have more elementary texts from the point of view of Aristotle's metaphysics. If some one of them avoided the snap-judgments that M. Maritain gives on Aristotle's predecessors and argued for the Aristotelian metaphysics with a more urbane and genial style (without losing M. Maritain's analytical brilliance), it would be, though but an elementary text, a momentous contribution to philosophical studies.

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AMHERST COLLEGE.

JOURNALS AND NEW BOOKS

REVUE PHILOSOPHIQUE. 56e Année, Nos. 5 et 6. La catégorie affective du surnaturel: *L. Lévy-Bruhl.* La philosophie spéculative de Whitehead: *J. Wahl.* Les dimensions du temps correspondant à l'expansion de la vie de l'esprit dans l'inconscient: *E. Lubac.* Le sort de la personnalité: *W. Drabovitch.* Le Langage (fin): *A. Ombredane.*

Ford, Adelbert: Group Experiments in Elementary Psychology. (Students' Manuel & Notebook.) New York: Macmillan Co. 1931. 241 pp. $1.25.

Fuller, B. A. G.: History of Greek Philosophy. Vol. II: Sophists. Socrates. Plato. Vol. III: Aristotle. New York: Henry Holt & Co. 1931. x + 493 pp.; 372 pp. $3.00; $2.75.

Geiger, George Raymond: The Philosophy of Henry George. (Ph.D. dissertation, Columbia University, 1931.) Grand Forks, N. D. 1931. 325 pp.

Glover, T. R.: The World of the New Testament. New York: Macmillan Co. 1931. 223 pp. $2.00.

Heindel, Max: The Rosicrucian Cosmo-Conception. 12th ed. Oceanside, Calif.: The Rosicrucian Fellowship. 1931. 606 pp. 75c.

Innominatus: Solution of the World-Riddle. Book One—Epistemology. San Francisco: Harr Wagner Publishing Co. 1931. $2.50.

Lanz, Henry: The Physical Basis of Rime. An Essay on the Aesthetics of Sound. Stanford University: Stanford University Press. London: Humphrey Milford. Oxford University Press. 1931. xiv + 365 pp. $6.75.

NOTES AND NEWS

The incumbent for the academic year 1931–1932 of the Roosevelt Professorship in Berlin will be Frederick J. E. Woodbridge, Johnsonian Professor of Philosophy at Columbia University. President Butler in announcing the appointment stated that "hereafter it will be open to the trustees of Columbia University to designate for this chair any American scholar who may be accredited for service in the University of Berlin, in the Technische Hochschule, in the Handel's Hochschule, or in the Deutsche Hochschule für Politik, as his subject of major interest may indicate." Professor Woodbridge will be accredited to the University of Berlin.

The Annual Meeting of the Mind Association and Joint Session with the Aristotelian Society will be held at Trinity College, Cambridge, July 3–5, 1931. The following arrangements have been made:

FRIDAY, JULY 3.

8 P.M. Chairman: Professor Edgell. Address by Professor Sorley.

SATURDAY, JULY 4.

10 A.M. Chairman: Professor Moore. Symposium—"Indeterminacy and Indeterminism." Dr. C. D. Broad, Sir Arthur Eddington, Mr. R. B. Braithwaite.

8 P.M. Chairman: Dr. Broad. Symposium: "The Coherence Theory of Goodness." Prof. H. J. Paton, The Provost of Oriel, Prof. J. L. Stocks.

SUNDAY, JULY 5.

10 A.M. Chairman: The Provost of Oriel. Symposium: "The Nature and Validity of Formal Logic." Dr. A. C. Ewing, Dr. F. C. S. Schiller, Mr. C. A. Mace, Mr. A. R. Knight.

8 P.M. Chairman: Prof. Sorley. Symposium: "Actuality and Value." Prof. Baird, Prof. G. Dawes Hicks, Prof. de Brugh.

Applications for membership and payments should be made to Prof. G. E. Moore, 86 Chesterton Road, Cambridge, Eng.